

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

James River

Waterbody Segment at a Glance:

Counties: Webster, Greene, Christian, Stone

Nearby Cities: Springfield, Ozark,
Nixa, Galena

Length of Impairment: WBID 2347 – 28 miles
WBID 2362 – 26 miles
WBID 2365 – 4.5 miles

Pollutant: Nutrients

Sources: Urban Point and Nonpoint Sources
Agricultural Nonpoint Sources



State map showing location of watershed

TMDL Priority Ranking: High

Description of the Problem

Beneficial uses of James River

2347 and 2362– Irrigation, Livestock and Wildlife Watering, Protection of Warm Water Aquatic Life and Human Health [associated with] Fish Consumption, Whole Body Contact Recreation, Boating and Canoeing, Cool Water Fishery.

2365 – Drinking Water Supply, Livestock and Wildlife Watering, Protection of Warm Water Aquatic Life and Human Health [associated with] Fish Consumption, Whole Body Contact Recreation, Boating and Canoeing, Cool Water Fishery.

Uses that are impaired

- Protection of Warm Water Aquatic Life
- Boating and Canoeing

Standards that apply

- The impairment of the James River is based on exceedence of the general criteria contained in Missouri's Water Quality Standards, 10 CSR 20-7.031 (3)(A) and (C). These criteria state:
 - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
 - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

Surface water quality problems in the James River have been documented since 1965. Historically, the major concern was low dissolved oxygen (DO) due to sewage and urban stormwater runoff. Data from a U.S. Department of the Interior water quality study on the James River in 1969 indicated elevated levels of nutrients, particularly when values were compared above and below the confluence with Wilson Creek. After the Springfield Southwest Treatment Plant was upgraded in 1977, a study by the United States Geological Service (USGS) found DO levels in the James River met the state standard of 5.0 milligrams per liter (mg/L).

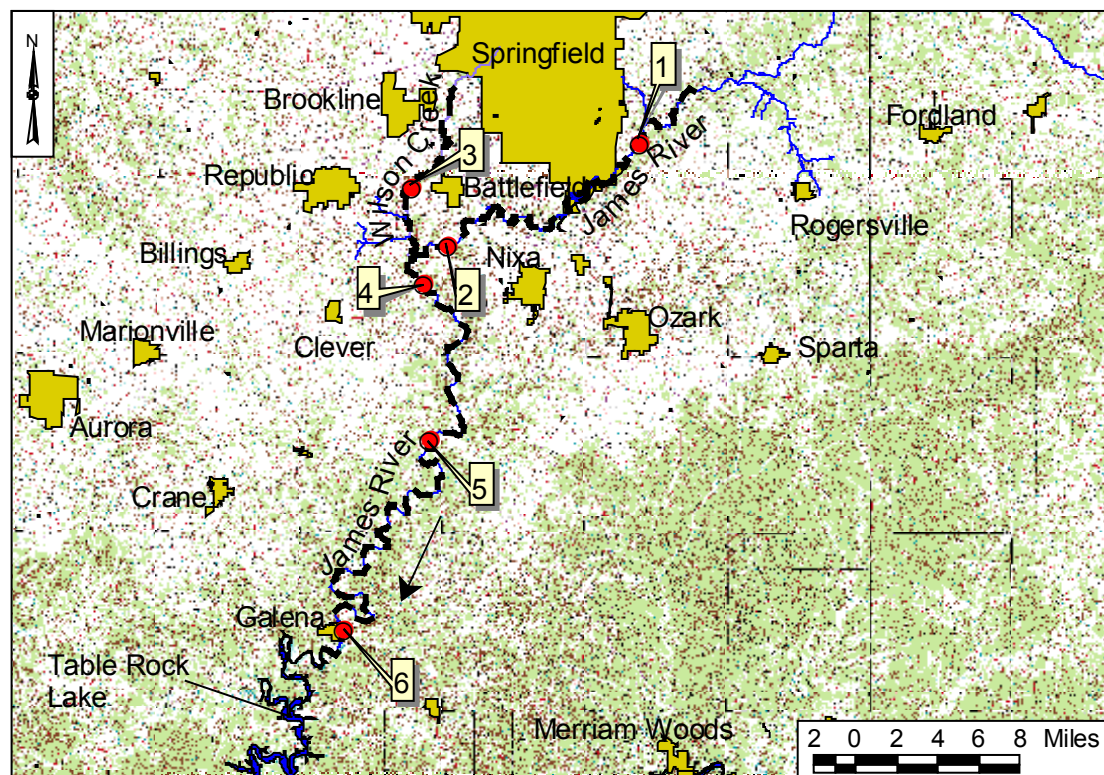
The current concern is the discharge of nutrients, especially phosphorus, from sewage treatment plants and the runoff of phosphorus and nitrogen from urban and agricultural nonpoint sources. When waters become rich in nutrients, it results in an increase in plant life and algal blooms. Excessive algal growth is not only aesthetically unpleasant, it causes fundamental changes in a water ecosystem. Dissolved oxygen in the water can become depleted when algal blooms die off and decay. Also, oxygen levels become depressed in the early morning hours when the sun has been down and plants have not been producing oxygen through photosynthesis, but overabundant aquatic life continues to consume oxygen. This can have serious negative impacts on what can survive in the water. The increased algal blooms in the James River have been frequently observed, but have not been scientifically quantified. A monitoring plan has been developed to provide data to evaluate the severity of the problem and to provide documentation of improvements in water quality as nutrient reductions occur.

Eutrophication is the term used to describe a water body that has become nutrient enriched. Eutrophication can be a normal condition that occurs after nutrients have washed off of the land over a long period of time. Table Rock Lake is undergoing eutrophication at a highly accelerated rate, particularly in the James River arm. There is extensive data documenting the decline in clarity and increase of chlorophyll (algae) in Table Rock. Because water quality in Table Rock Lake is a concern, action has been taken to ensure water quality standards will be met. A phosphorus limit has been adopted by the Missouri Clean Water Commission of 0.5 mg/L for all point sources that have a design discharge greater than or equal to 22,500 gallons/day in the Table Rock Lake watershed.

Based on scientific literature, the target load in the James River for total phosphorus has been set at 0.075 mg/L and the in-stream total nitrogen target load has been set at 1.5 mg/L. It is hoped that these levels of nutrient loading will ultimately keep algal growth in the James River and the James River arm of Table Rock Lake at acceptable levels. Reducing the nutrient load in the James River is essential to return the river to a balanced, unimpaired condition. All sources of nutrient discharges or runoff will need to participate in reducing the phosphorus and nitrogen loading in order for the restoration effort on the James River to succeed. This TMDL will be developed in phases with the first phase focusing on nutrient loading from point sources and urban stormwater runoff. The second phase will focus on all nonpoint sources of nutrient loading in the watershed. This TMDL was approved by the U.S. Environmental Protection Agency May 7, 2001. A map of the James River area and graphs that summarize the existing data can be found below.

For general information on TMDL issues, see the Environmental Protection Agency's TMDL Web page: www.epa.gov/owow/tmdl/

Map of Impaired Portion of James River Showing Location of Sampling Sites



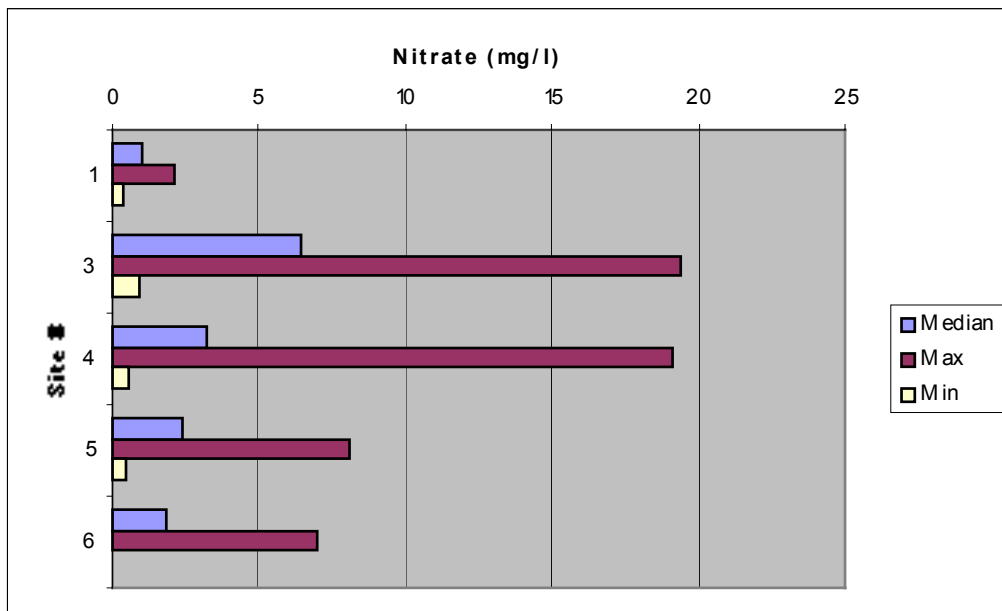
----- Impaired segment

→ Direction of flow

Site Index

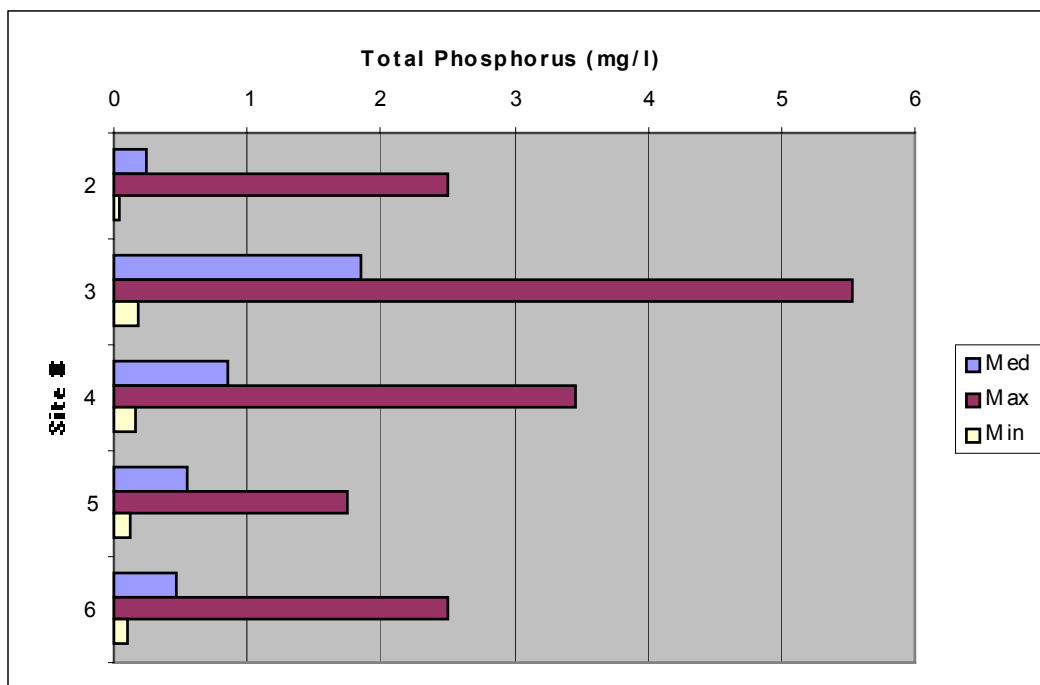
- 1 – James River at Kinser Bridge
- 2 – James River at Nelson Mill
- 3 – Wilson Creek at North End of National Park
- 4 – James River at Delaware Access
- 5 – James River at Hootentown Access
- 6 – James River at Galena

Nitrate concentrations at selected sites in the James River and Wilson Creek, 1992-1999



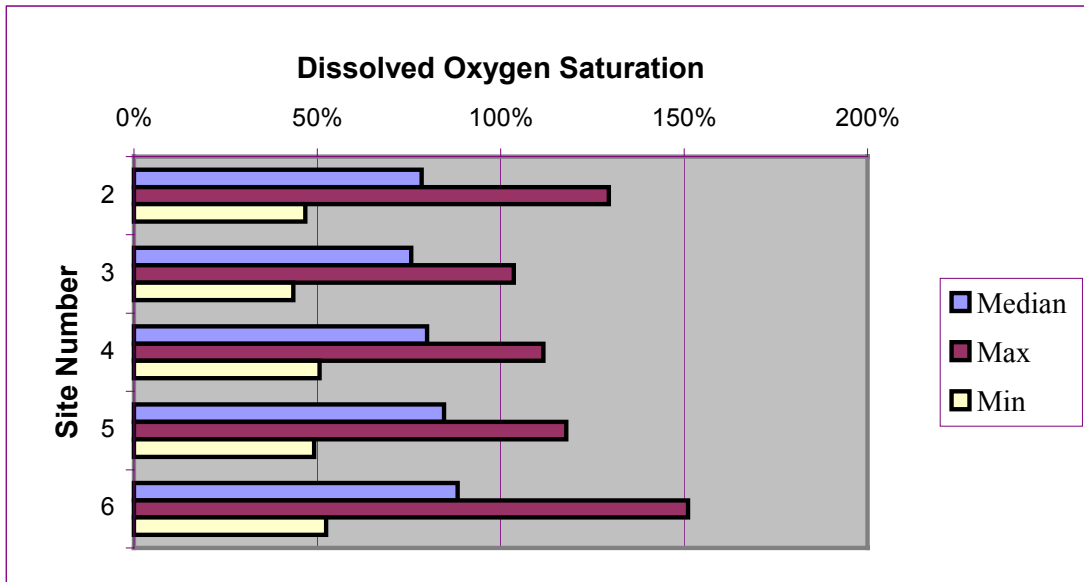
Sources: City Utilities of Springfield, City of Springfield Public Works

Total Phosphorus concentrations at selected sites in the James River and Wilson Creek, 1993-1999



Source: City of Springfield Public Works

Dissolved Oxygen Saturation at selected sites in the James River and Wilson Creek, 1993-1999



Source: City of Springfield Public Works

For more information call or write:

Missouri Department of Natural Resources

Water Pollution Control Program

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